

An Interactive Animated Flash Module to Teach Animation Principles to Community College Digital Media Students

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Abstract:

This design project will test the value of a Flash animated, interactive module in teaching animation principles in the Leeward Community College Digital Media Department. Studies have indicated that modern learners are less focused over long periods of time and are accustomed to multiple streams of simultaneous information. This design project will create an animated interactive Flash module to teach the animation principles of *Arcs*, *Timing* and *Squash and Stretch*. The module will be accompanied by pre and posttests to analyze the effectiveness of this content delivery alternative. Results from this analysis may direct the instructors of the Digital Media Department to create more modules such as this one, and a simultaneously integrate such modules with the online education that is being expanded by the college.

Project Description

Digital Media (DMED) 140 The Principles of Animation is a required course for all Digital Media students at Leeward Community College (LCC) that wish to graduate the program with a degree. The core concepts of DMED 140 are the Seven Principles of Animation. These seven principles are the following: (1) *Arcs*, (2) *Timing*, (3) *Squash and Stretch*, (4) *Reversal of Curves*, (5) *Successive Breaking of Joints*, (6) *Secondary Motion*, (7) *Overlapping Action*. These concepts are difficult to learn. The goal of the module is to instruct students of the Leeward community College Digital Media Department in the three Principles of Animation; *Arcs*, *Timing* and *Squash and Stretch*. The target population for this module is the community college student of Leeward Community

College's Digital Media Department. The learners range in age from 18 years to 72 years old. They are men and women of a diverse ethnic background. Most of the students come from the Leeward part of Oahu. This project is tailored to the unique capabilities of the Adobe Flash software.

Many of the LCC students have short attention spans. The students' ability to focus on abstract concepts for an extended period of time is limited. One study suggests that due to the high pace of modern society many people suffer from a pseudo Attention Deficit Hyperactive Disorder (ADHD) (Geist, & Gibson 2000).

Research indicates that students with enhanced spatial skills benefit from graphics and animation as a method of relating key concepts (ChanLin 2000). Barkley (2005) states in the case of ADHD adolescents "...increasing the novelty and interest level of the tasks through the use of increased stimulation..." (p236) can enhance attention improving student performance. It is also observed that many traditional practices in education can lead to large problems and therefore a new mindset in educational design is needed (Lebow n/d). Animation helped bring instruction to life "grabbing the attention" of the learner in one classroom study (Schaffhauser 2008). Animation was used in a Virginia high school chemistry class to teach state standards on chemical compounds and their corresponding formulas.

The intent of this module is to present animation principles through the use of interactive flash technology. Several online animation education sites use a web page approach with simple text and images to present content (awn.com, makemovies.com, karmatoons.com). The construction of this module will go beyond the simple uses of web

pages and text, working with buttons, embedded videos, audio components and animation.

Animation is engaging and eye-catching. The popularity of animation has been seen in the plethora of animated cartoon, films and video games that continue to be produced each year. Animation instruction, however, can be dry and unappealing. Much class time is devoted to the dissemination of principles that in order to be utilized by students in their digital media projects, must be comprehended. Today's learners are increasingly challenged in lecture situations, having been accustomed to the multiple streams of information that surround them in the many media of modern society.

On the one hand the problem of learners that require more and varied stimulation to maintain focus, and on the other hand the dry content of the animation principles unit that is a part of the Digital Media Program at Leeward Community College. Perhaps one innovative solution to this problem may be the use of animation and multi media techniques in the dissemination of the animation principles content.

This project will test one such module in the community college setting to help determine if animation and multimedia approaches are effective in delivering course content. Modern learners need to be engaged in ways that are current to their time. The purpose of this project is to determine if an animated interactive Flash Module can be used to teach animation principles to community college Digital Media students.

Instructional Analysis

The domain of learning for this project is the cognitive domain.
The learning objectives with corresponding subset skills of the module are:

- Students demonstrate an the concepts of Arcs in animation.

- Students identify arcing motions from video content
- Students choose logical arcs when designing motion
- Students demonstrate the two most important aspects of timing in animation.
 - Students identify timing as it affects physical weight of an object
 - Students identify timing as it affects emotions in acting
- Students demonstrate the concept of Squash and Stretch in natural forms.
 - Students identify Squash and Stretch in contours of simple forms
 - Students identify Squash and Stretch in interior forms of complex bodies

Design Methodology

The goal of my module is to instruct students of the Leeward community College Digital Media Department in the three Principles of Animation; Arcs, Timing and Squash and Stretch.

Target audience.

The target population for this module is the community college student of Leeward Community College's Digital Media Department. They range in age from 18 years to 72 years old. They are men and women of a diverse ethnic background. Most of the students come from the Leeward part of Oahu. The economic background of most learners is low to middle income. The computer literacy of the students encompasses a wide spectrum of competency from novice to multiple years of experience. As a group, they are busy with commitments to family and jobs leaving little time for study outside of class. Several of the students have learning disabilities or other health problems that challenge their note-taking and class participation. Table 1 provides a further breakdown

of Learner Characteristics. Please note the wide spectrum in age and ability of the target population.

Table 1.
Learner Characteristics

Cognitive characteristics	Psychomotor characteristics
<ul style="list-style-type: none"> • Basic knowledge of computers • Some learners with short attention spans • Some learners with mild psychological challenges • Many learners earning two year associate degrees 	<ul style="list-style-type: none"> • 18 to 60 years of age • Most learners fully functioning • Some learners physically challenged • Male and Female learners • Some learners with chronic health conditions
Affective characteristics	Social characteristics
<ul style="list-style-type: none"> • Some learners motivated toward career in animation • Some learners unmotivated: taking animation course to fulfill requirement • Some learners casually interested in subject 	<ul style="list-style-type: none"> • Some learners with no family members on island • Some learners living with parents • Some learners have children • Most learners in lower and middle economic classification • Most learners residents of Leeward Oahu

Module development.

The module will involve viewing video clips, and listening to audio commentary, leading to an embedded test where learners will make choices using buttons and interactivity in flash. Immediate feedback will be provided as to the correct/incorrect nature of the learner input. The module will end with a review section of the content. It is appropriate to choose the Flash movie format for several reasons. The module is teaching animation principles; therefore it is appropriate that sample movies and animations play during the content portions of the module. Flash supports the use of movie clips as well as the on-board creation of animations including the uses of audio

and text. It is appropriate for the audience of learners because they have an intrinsic motivation to work with computers. They are learners that have voluntarily involved themselves in the pursuit of acquiring computer skill sets.

Previous uses of interactive media to illustrate Animation Principles were incomplete and limited in their use of interactivity. This module will use a unique combination of animation clips, video clips, audio elements, text and interactivity that to date has not been observed in animation education modules.

To create the module three main software tools will be used; Adobe PhotoShop, Adobe Flash CS4 and Final Cut Pro 6. A digital video camera will be used to record video reference. A scanner will be used to input drawn resources, and microphone to record audio and sound effects. A current Macintosh Computer will be used to create, assemble and output the module.

To participate in the module learners will use the Macintosh computers in the Digital Media Lab at Leeward Community College. These computers will be equipped with the current version of the Adobe Flash Player.

Instructional strategy.

The module is chunked into 5 sections. The first section is the introduction. In this section the learners will be presented with examples, side-by-side, of good and bad animation. This section will serve as a hook to grab the attention of the learners, and also as a way to outline what will be covered. Learners will then proceed into each of the 3 content areas. The first section will introduce them to the animation principle of Arcs. Once they are comfortable with this information they will answer three questions about arcs using buttons in the Flash Window. They will receive immediate feedback on their

answers within the module. Next they will proceed to the second content section on the animation principle of Timing. Once again when they are comfortable they will answer three embedded questions with buttons present in the Flash window. After viewing feedback on their answers, they will finally proceed to the third content section explaining the animation principle of Squash and Stretch. After completing the embedded questions at the end of the final content section and receiving feedback, the learners will proceed to the fifth stage, which will review the main points of the three content sections. Table 2 outlines these sections and their respective times for completion. The final time will be determined by user input.

Table 2
Instructional Strategy Breakdown

Introduction	Beginning Animation Principles Intro Good and Bad Animation	1.5 minutes
Arcs	Video Example Animated Non-example Animated Example Embedded Test	4.5 minutes
Timing	Animation Example 1 : Weight Animation Example 2 : Emotion Head-turn Game Embedded Test	6.0 minutes
Squash and Stretch	Video Example 1 Video Example 2 with Drawn Overlay Animated Non-example Animated Example Embedded Test	5.5 minutes
Review Section	Review Key Concept Review Examples / Non-examples Ending	3 minutes

Formative Evaluation Methodology

Site

The module will be delivered in the Digital Media Lab, BS-104, at Leeward Community College. Students will be seated at Apple computers and run the flash (.swf) file, which will take them through the content. No special permission will be required for the use of these facilities because the researcher will be testing the module in a previously scheduled class. Students of that class wishing to opt out of the module testing will be presented with alternative class work to account for their class hour during testing.

Test audience.

The module will be tested on fifteen current Digital Media students at Leeward Community College. They range in age from 18 years to 72 years old. They are men and women of a diverse ethnic background. Most of the students come from the Leeward part of Oahu. The economic background of most learners is low to middle income. The computer literacy of the students encompasses a wide spectrum of competency from novice to multiple years of experience. This sample group is a logical connection since many of the members are current Digital Media Students.

Evaluation procedures.

Feedback on the module will be in 2 stages. Content expert feedback will be delivered in written form after a one-on-one trial of the module with a senior animator in the field of full animation. Dave Pruiksma is a twenty-year veteran of Disney Feature Animation production in Burbank California.

The second round of feedback will be from a paper-based pre and posttests given before and after the learners work through the module. Small group testing will have a group of 15 learners from the sample population complete a paper-based pre-test, the

content Flash module on the computer and finally a paper-based posttest. The facilitator will distribute and collect the pre and post-tests. The module itself will contain an embedded test, however, no data from the embedded test will be tabulated. Consent letters will be signed and collected by participants prior to the testing.

Instruments.

The pretest will consist of two multiple-choice questions per learning objective. It will be paper-based and students will indicate their responses by circling the answer of their choice from four possible answers. Test questions will vary in design along the following approaches; visual analysis, term recognition and deductive reasoning. The posttest will be constructed the same way with the same number of comparable questions. The embedded test will not record data. As part of the Flash module, the embedded test will provide learner feedback after the content section has been presented to reinforce the information.

Data analysis plan.

Data from the pre and posttests will be tabulated and visually presented using graphs and charts in the final write-up and online conference. The analysis will be quantitative focusing on right and wrong answers to the test questions.

Timeline

Table 3 indicates the researcher timeline of key events. The timeline is complete through the conference presentation date. Table 4 outlines the participant timeline of key events; including content expert review and small group testing.

Table 3

Researcher Timeline

<i>October, 2009</i>	Submit Proposal Write objectives Content Analysis, Instructional Heirarchy Acquire Digital Materials; Shoot Video Create Animations Record Audio Plan Module Chunking Write Script
<i>November, 2009</i>	Construct Flash .swf File Revise Based on Advisor Feedback Write test items
<i>December 2009</i>	IRB Packet Submission Final Output; Finished Flash (.swf) File
<i>January, 2010</i>	One-on-one Content-expert Testing
<i>February, 2010</i>	Revise Based on Feedback Small Group Testing Collect Data
<i>March, 2010</i>	Write-up
<i>April, 2010</i>	Online Conference Presentation

Table 4
Participant Timeline

<i>DATE</i>	<i>ACTION</i>
One-one-one Testing; Content-expert Review	
January, 2010	Content-expert: Module Review and Feedback
Small Group Testing:	
February, 2010	Small Group Testing in Lab; Consent Form, Pretest, Module Completion, Posttest

Implications of Research

The level of complexity this project proposes in the design of its multi-media module is something that has not been done yet in the field of animation education. The project will help determine the effectiveness of methods of instruction among learners of the community college system. The success of such an approach will allow motivation for Leeward Community College to broaden its concept of the educational process as regards the transfer of information. If successful this module will be expanded for use in the animation classes at Leeward Community College. It will also provide useful insight into how modern learners can best be served in the classroom. The usefulness of stand-alone interactive modules like this in asynchronous learning and distance education is readily apparent. Flash modules can be easily used via the Internet or on local computer resources with in the absence of network connectivity. As the needs of learners change and technology moves forward, the argument for use of multimedia in the classroom will only increase.

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